

**NATIONAL INFRASTRUCTURE ADVISORY COUNCIL**

*Meeting Minutes for the July 13, 2010 Meeting*

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**NATIONAL INFRASTRUCTURE ADVISORY COUNCIL**

**BUSINESS MEETING AGENDA**

National Press Club  
Ballroom  
529 14<sup>th</sup> Street, NW  
Washington, DC 20045  
July 13, 2010  
1:30 PM – 4:30 PM EDT

- I. OPENING OF MEETING** *Nancy J. Wong*, Designated Federal Officer (DFO), NIAC, Department of Homeland Security (DHS)
- II. ROLL CALL OF MEMBERS** *Nancy J. Wong*, DFO, NIAC, DHS
- III. OPENING REMARKS AND INTRODUCTIONS** NIAC Chairman *Erle A. Nye*, Chairman Emeritus, TXU Corp.  
  
*The Honorable Sue Armstrong*, Deputy Assistant Secretary for Infrastructure Protection, DHS
- IV. APPROVAL OF APRIL 2010 MINUTES** NIAC Chairman *Erle A. Nye*, Chairman Emeritus, TXU Corp.
- V. WORKING GROUP: A FRAMEWORK FOR ESTABLISHING CRITICAL INFRASTRUCTURE RESILIENCE GOALS** *Alfred R. Berkeley*, Chairman and Chief Executive Officer, Pipeline Trading Systems, LLC (former Vice Chairman, The NASDAQ Stock Market, Inc.), NIAC Vice-Chairman, Working Group Co-Chair; and *Michael Wallace*, Vice-Chairman, Constellation Energy, Chairman, UniStar Nuclear Energy, NIAC Member, Working Group Co-Chair
- VI. WORKING GROUP: OPTIMIZATION OF RESOURCES FOR MITIGATING INFRASTRUCTURE DISRUPTIONS** *Margaret E. Grayson*, Principal, Essential<sub>2</sub>Management, NIAC Member, Working Group Co-Chair; and *Thomas E. Noonan*, Former General Manager, IBM Internet Security Systems, NIAC Member, Working Group Co-Chair

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### IV. NEW BUSINESS

NIAC Chairman *Erle A. Nye*, Vice Chairman *Alfred R. Berkeley III*, NIAC Members

### VI. ADJOURNMENT

NIAC Chairman *Erle A. Nye*, Presiding

## MINUTES

### NIAC MEMBERS PRESENT IN WASHINGTON:

Mr. Alfred Berkeley, III; Lt. Gen. (ret.) Albert Edmonds; Ms. Margaret Grayson; Mr. Michael Wallace

### NIAC MEMBERS ATTENDING VIA CONFERENCE CALL:

Mr. Erle Nye; Mr. Wesley Bush; Chief (ret.) Gilbert Gallegos; Mr. Thomas Noonan; Hon. Tim Pawlenty; Mr. James Reid; Ms. Martha Wyrsh

### MEMBERS ABSENT:

Mr. David Bronczek; Mr. Philip Heasley; Commissioner Raymond Kelly; Mr. David Kepler; Ms. Martha Marsh; Mr. James B. Nicholson; Mr. Gregory Peters; Mr. Bruce Rohde; Dr. Linwood Rose; Mr. Matthew Rose; Mr. Greg Wells

### SUBSTANTIVE POINTS OF CONTACT PRESENT IN WASHINGTON:

Mr. Ed Goetz (for Mr. Michael Wallace); Mr. Bill Muston (for Chairman Nye); Dr. Ronald Luman (Vice Chairman Berkeley)

### SUBSTANTIVE POINTS OF CONTACT ATTENDING VIA CONFERENCE CALL:

Ms. Frances Paulson (for Mr. David Bronczek); Ms. Brooke Lundquist-Beebe (for Mr. David Kepler); Mr. Bill Fischer (for Mr. James B. Nicholson)

### OTHER DIGNITARIES PRESENT:

The Honorable Todd Keil, Assistant Secretary for Infrastructure Protection, DHS; The Honorable Sue Armstrong, Deputy Assistant Secretary for Infrastructure Protection, DHS; The Honorable William Flynn, Deputy Assistant Secretary for Infrastructure Protection, DHS; and Ms. Nancy Wong, DFO, NIAC, DHS

### I. OPENING OF MEETING

*Nancy J. Wong*, DFO, NIAC, DHS

Ms. Nancy Wong, the Designated Federal Official (DFO) for the NIAC, called the meeting to order and welcomed all individuals, both in person and via teleconference, to the NIAC Quarterly Business Meeting (QBM). Ms. Wong introduced Chairman Nye, Vice Chairman Berkeley, and Deputy Assistant Secretary for Infrastructure Protection, Sue Armstrong, as well as the other NIAC members.

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Prior to conducting the NIAC roll call, Ms. Wong provided a brief synopsis of the Council, its formation, history, pertinent reports and studies produced, and positive feedback and reception of its products by DHS and the rest of the federal government. In October 2009, the President of the United States renewed the NIAC charter, a document outlining the role of the Council as providing both the President and Secretary for the Department of Homeland Security with advice on the security of both physical and cyber infrastructure and key resources.

Ms. Wong stressed the public/private partnership both shown within the Council and in the critical infrastructure and key resources environment, on which the national economic and public safety depend upon. Ms. Wong closed with a brief recap of the agenda for the day, highlighting the deliberation regarding the two studies currently being conducted by the NIAC as well as an in-depth discussion of a future Council tasking.

### **II. ROLL CALL**

*Nancy J. Wong, DFO, NIAC, DHS*

Ms. Wong called roll and recorded attendance noting members' in person or teleconference presence.

### **III. OPENING REMARKS AND INTRODUCTIONS**

*NIAC Chairman Erle A. Nye,  
Chairman Emeritus, TXU Corp.*

Upon completion of the roll call, Ms. Wong reminded members of the Council that the meeting is open to the public and that care should be taken if and when discussing issues of a sensitive matter. Ms. Wong stated that if the public wished to contribute input for consideration by the Council that they follow the guidance and protocols that are described in the notice for the QBM. Upon completion of these comments, Ms. Wong turned the meeting over to Chairman Nye.

Chairman Nye thanked Ms. Wong and welcomed all attendees to the meeting, both individuals present and via teleconference. Chairman Nye announced that since the April meeting, additional resignations had brought total NIAC membership down well below the authorized 30 members and expressed concern on how this could limit the Council's effectiveness. Chairman Nye stated that through outreach and coordination with the current Administration, he looked forward to having the membership raised to the authorized number which would benefit everyone involved with the Council. Chairman Nye turned the microphone over to Vice Chairman Berkeley for opening comments.

Vice Chairman Berkeley thanked Chairman Nye and stated that he had no opening remarks before recognizing Deputy Assistant Secretary for Infrastructure Protection Sue Armstrong for her opening comments. Ms. Armstrong thanked both Chairman Nye and Vice Chairman Berkeley and noted that Assistant Secretary Keil would be joining the Council meeting momentarily.

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Deputy Assistant Secretary Armstrong began her remarks by speaking to the issue of vacancies that the NIAC is currently facing and the status of recommendations that have been sent to the White House. According to Ms. Armstrong, filling NIAC membership vacancies is an important issue to DHS and one that is being addressed. She pledged support in assisting with the goal of achieving the authorized number. She continued her remarks noting that the NIAC continues to serve an important advisory role to the Office of Infrastructure Protection (IP) particularly regarding the studies that are produced. These studies and their recommendations lead to the next level of infrastructure protection and help to form the basis of doctrine and subsequently, planning and programs out in the field.

Ms. Armstrong followed up on dialogue discussed at the April meeting regarding the Quadrennial Homeland Security Review (QHSR) which has resulted in a thorough evaluation of all infrastructure protection programs and activities. Assistant Secretary Armstrong reminded the Council that the QHSR was a bottom up review of all DHS activities ultimately resulting in the establishment of initiatives DHS would consider in the 2012-2016 timeframe. The process will have a direct impact on how resources are aligned to both new and existing projects. She further noted that all DHS employees are giving this review serious attention.

Ms. Armstrong reported that the QHSR has shown that resilient critical infrastructure has presented itself as a fundamental goal within DHS and will continue to be a priority in the future. A final point mentioned regarding the QHSR, was that the review has led to a DHS IP initiative to deliver infrastructure protection programs and capabilities at both the regional and local level.

The excellent work and output by the NIAC were recognized by Ms. Armstrong who further stated that this effort has led to a number of the programs that IP is implementing. Recognizing that the hurricane season has begun, Ms. Armstrong noted that the NIAC work on critical infrastructure resilience is timely. Assistant Secretary Armstrong expressed her interest in hearing the updates on the two studies underway and stated that she hoped this work would be applied to the metrics that DHS is examining. Assistant Secretary Armstrong closed her remarks by thanking Chairman Nye and the NIAC.

#### **IV. APPROVAL OF APRIL 2010 MINUTES**

*NIAC Chairman Erle A. Nye,  
Chairman Emeritus, TXU Corp.*

With opening remarks complete, Chairman Nye moved to the adoption of the minutes for the April 2010 NIAC meeting. Before entertaining a motion on the minutes, Chairman Nye asked that Frances Paulson, POC for David Bronczek, be added to the list of attendees at the April meeting. With no other comments or corrections raised, Chairman Nye entertained a motion to approve the April 2010 meeting minutes. Vice Chairman Berkeley motioned to approve the minutes which was seconded by another Council member. With the motion being seconded, Chairman Nye prompted the NIAC to vote

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aye or nay. The NIAC members unanimously responded in the affirmative. Upon that, Chairman Nye confirmed that the motion was passed by voice vote and the minutes from the April 2010 NIAC meeting were approved.

**V. WORKING GROUP:  
A Framework for Establishing  
Critical Infrastructure Resilience  
Goals**

*Alfred Berkeley, III, Vice Chairman  
Chairman and CEO  
Pipeline Trading, LLC*

*Michael Wallace, NIAC Member  
Vice Chairman,  
Constellation Energy;  
Chairman, UniStar Nuclear Energy*

Chairman Nye introduced the *Framework for Establishing Critical Infrastructure Resilience Goals* Working Group by stating it represented a continuation of prior work conducted by the NIAC on resilience. He then turned the meeting over to Vice Chairman Berkeley and Mr. Michael Wallace for their update on this study.

Vice Chairman Berkeley thanked Chairman Nye and then proceeded to briefly describe the working group's study before deferring to Mr. Wallace for the formal presentation of the findings. Upon his introduction, Mr. Wallace thanked both Chairman Nye and Vice Chairman Berkeley and stated that each study group meeting had been productive with engaging dialogue and observations discussed by the members. There is consensus among the members of this study that the resulting product will be extremely beneficial to the sectors examined as well as the entire critical infrastructure environment.

Mr. Wallace introduced the agenda for the presentation which included discussion on the following: the objectives of the approach, the members on the study group, the progress in the electric sector that is coming into focus from the analysis that has been conducted, and results of a recent formal stress test on the electric sector.

Mr. Wallace reiterated that the high-level objective of the study is to assess how the critical infrastructure sectors are currently prepared to deal with events that draw on their need to be resilient as well as the strategies that are in place to mitigate risk to threats faced in an all hazards environment. This assessment leads to the next objective, developing a process to aid all sectors in defining their own resilience goals coupled with recommending policies to strengthen resilience in the critical infrastructure and key resources community.

Mr. Wallace shifted the presentation to focus on the approach of this study. He mentioned that the study was designed to first look at three sector groupings: nuclear/electricity, oil/natural gas, and transportation. The logic behind this approach was to take the best practices and lessons learned and apply them to other sectors. The group is assessing current practices, strategies, and structure resilience in both stressed

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and non-stressed scenarios to establish sector goals, policies, and practices to enhance resilience with each study rolling into the next grouping.

The next topic discussed concerned the reasoning behind combining the nuclear and electric sector. Mr. Wallace mentioned the work that had already been done in the nuclear sector such as Comprehensive Review studies that have been done in collaboration with DHS. Though much of the information has remained classified, the working group had the opportunity to view the framework, results and process and found them to be quite helpful when examining the electric sector. One major lesson learned from the nuclear sector was that creating stress to the point of breaking is an effective method of developing valuable insights.

Mr. Wallace briefly highlighted the group membership and thanked them for their continued participation. Mr. Wallace also mentioned specific companies that had been involved to include: Constellation Energy and its subsidiary Baltimore Gas & Electric; Dominion and its subsidiary Virginia Power; the Tennessee Valley Authority, American Transmission Company, PJM, and NERC.

Mr. Berkeley mentioned the key role that Ken Daly of the National Association of Corporate Directors plays in the study. Mr. Berkeley noted Mr. Daly's position provides the ability to reach out to all public companies and the hope is upon completion of this report, its results will be distributed to that community and resonate with them. At this point he turned the presentation back to Mr. Wallace.

Mr. Wallace shifted attention to the 16 interviews of CEO's, policy leaders and executives which had been conducted across the electricity sector ranging from publicly owned utilities, public power, municipalities, and CO-OPS. It is hoped that at the time of completion of interviews, the entire country will be represented in this process. He also mentioned that more than 50 studies had been examined by the group and the results from that specific research have proven extremely valuable.

The next study milestone, a CEO Roundtable, is scheduled to occur on July 14, 2010. According to Mr. Wallace, solicitation of the utility community resulted in 16 CEOs participating from around the country. The intent of this roundtable is for this group to review the objectives to date as well as take advantage of the natural synergy generated when a large group of executives gathers to exchange ideas and experience regarding similar issues. Mr. Wallace stated that this roundtable has the potential to provide the most complete set of recommendations and findings to date.

The resilience framework of the study was the next topic of discussion. Mr. Wallace stated that the framework utilized was provided by Mr. Steven Flynn and has been used before in a number of previous studies. Mr. Berkeley noted that variations of this framework are presenting themselves in a number of other resilience-based studies and it was imperative not to build a new vocabulary but rather build on a basis the community feels is effective. This framework has four distinct levels: robustness (or ability to absorb

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an incident); resourcefulness (how to manage once an incident has occurred); rapid recovery (getting back up quickly); and adaptability (absorbing new lessons from a catastrophe).

Mr. Wallace chose the electric sector to provide assistance with understanding the categories of the resilience framework. The interconnected grid provides robustness to the electricity sector, including infrastructure and assets, through redundancy. Within the resourcefulness category, the electricity sector has highly trained individuals in the regional transportation organizations who are prepared and educated to take action in the case of incident to prevent cascading failures. Regarding the rapid recovery category, all utilities have mutual aid agreements providing an opportunity to draw on neighbors to help get up to speed quickly, established protocols for getting critical parts of the sector up and running, and a shared inventory of transformers and spare transmission towers. Finally, Mr. Wallace addressed the adaptability category, explaining that once the incident had subsided, that best practices and lessons learned are developed, reviewed, incorporated in the emergency plans, and infrastructure and assets are adjusted accordingly.

Next, Mr. Wallace focused on the stress test exercise recently conducted with Baltimore Gas & Electric. This type of exercise was identified as a best practice/lesson learned from the nuclear sector and deemed applicable to the electric sector. The goal was to create a situation where catastrophic damage to the grid transpired; stressing the sector well beyond a traditional scenario that had been experienced in the past (such as tornadoes, earthquakes or other natural disasters), and addressing the impact by identifying the long-term issues and concerns. By testing under a high impact, low frequency scenario, the identified gaps and lessons learned could be applied to incidents that were more traditional and less stressful to the sector.

The working group chose to identify two highly critical substations and transmission lines and destroy them in a way that would not allow them to be brought back up in a short timeframe. The scenario provided an additional inject by taking out most of the key personnel which further stressed the system. The results of such an event showed a significant recovery time period (~6 months) along with daily outages that would disrupt essential services and create horrific economic ramifications.

Mr. Wallace stated that many of the gaps identified in this test had presented themselves in earlier studies, including sub-station security and limited availability of long lead-time high voltage transformers which are a main reason for such a lengthy recovery time. Other vulnerabilities were a lack of individuals with experience in dealing and managing such disastrous events and the issue of retrieving equipment in a crime scene environment if identified as a terrorist incident. Long-term issues focused on cost of recovery for a high impact/low frequency event, immediate access, and potential tension between the public sector, federal/state and private sector.

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Mr. Wallace next focused on issues related to electric resilience, providing an examination of areas affecting electric sector resilience and specific issues found within each. Infrastructure design and assets was the first area reviewed and analysis revealed that large investment in long lived capital assets, securing rights of way for interconnection and expansion, and increased use of digital controls could introduce new vulnerabilities to the sector. Next, the supply chain was examined and it was noted that the long lead time and reliance on foreign vendors hampers resiliency of the chain. Providing examination of other issues affecting electric sector resilience, Mr. Wallace stated that the most challenging risk landscape is focused on high impact/low frequency events including: a cyber attack, electromagnetic pulse, geomagnetic storm, or pandemic. Standards have to be addressed carefully, pushing them toward, rather than pulling them away from, a resilient nature. The issue of information sharing was also discussed. Mr. Wallace stated chief concerns included not getting enough information to the owner/operators of the critical infrastructures, as well as classification and clearances. Sector interdependencies including oil and natural gas, telecom and transportation; workforce age and lack of expertise; markets and regulatory structure; public/private roles and responsibilities; and standards rounded out the issues affecting electric sector resilience.

Closing his remarks, Mr. Wallace again touched on the upcoming CEO Roundtable and the hope that the executives attending will be able to provide insight into how the electrical grid can become more resilient under the four-level resiliency model. He also briefly discussed the remaining steps of the study, including: completing the interview process, conducting final research, and development of the findings and recommendations. Mr. Wallace suggested to the potential participants in future sector groupings to begin formulating ideas and a plan for their specific area of focus. He noted that the planning process took a substantial period for the electric sector and that was critical time that could have been devoted to working on the study. With that, Mr. Wallace thanked Chairman Nye and Vice-Chairman Berkeley and asked if there were any questions he could address.

Chairman Nye thanked Mr. Wallace and Mr. Berkeley for their hard work as well as commending them for a great approach to the study; one that could be a pattern for future sectors. Chairman Nye agreed with the idea of positioning individuals and assets prior to the next sector study, but noted the issue of NIAC vacancies currently facing the Council would make this problematic. Chairman Nye then opened up the meeting to any specific questions or comments to the study.

Mr. Berkeley stated that the working group was looking for feedback from the NIAC members regarding the direction of the study, noting that if there was any concern it would be good to raise it before the study went forward. Upon receiving no questions or concerns, Mr. Berkeley announced that both Assistant Secretary for Infrastructure Protection Todd Keil and Deputy Assistant Secretary William Flynn had arrived at the meeting, and Chairman Nye offered both of them the opportunity to make any comments or questions to the current study being discussed.

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Mr. Keil deferred to Mr. Flynn who thanked the Chairman and the entire Council. He then asked Mr. Wallace if, during the course of the study, the group had seen anything that could help identify the highest risk or single point of failure on the physical side. Mr. Wallace responded highlighting two conclusions the group has made to date: 1) the electricity grid is highly reliable and resilient for the type of events that the sector has seen in the past and 2) it is the high impact/low frequency incidents that are the sector's greatest vulnerabilities. Mr. Wallace concluded that the hope coming from both the study and stress scenario was that vulnerabilities could be identified and labeled; resulting in a substantial and constructive dialogue with DHS.

Chairman Nye, before recognizing the next NIAC study, asked if Assistant Secretary Keil wanted to provide any remarks at this time. Mr. Keil thanked the Chairman and said he would defer his comments until the end of the meeting. With that, Mr. Nye turned the meeting over to Ms. Peg Grayson and Mr. Tom Noonan for their presentation of the *Optimization of Resources for Mitigating Infrastructure Disruptions* study.

**VI. WORKING GROUP:  
Optimization of Resources for  
Mitigating Infrastructure Disruptions**

*Margaret Grayson, NIAC Member*  
Principal  
Essential2Management

*Mr. Thomas E. Noonan,*  
*NIAC Member*  
Former General Manager,  
IBM Internet Security Systems

Ms. Grayson thanked Chairman Nye and the Council and mentioned that the presentation would be divided between her and Mr. Tom Noonan. She also noted that the group is fortunate to have a number of capable resources at their disposal and have drawn upon many of them as the study unfolded.

Ms. Grayson opened with a brief overview of the presentation to members including; the context of how the study was formed, key aspects to enhance the synergy between critical infrastructure and community resilience, approach and status of different samples of emerging consensus points that are coming forward from the evaluation, potential recommendations and finally discussion of the study leadership.

Ms. Grayson noted that this study reflects the Administration's new strategic direction for homeland security by extending beyond traditional critical infrastructure and key resources to communities and people. This project will embrace the entire sphere of infrastructure related services and products and build on the findings from the 2009 NIAC *Critical Infrastructure Resilience* report. It was noted that the 2009 study specifically excluded community resilience, and the reasoning behind this was that the

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information and data discovered early made it clear that substantial research and work needed to be accomplished to properly address such a critical issue.

Two leading questions in framing the study were introduced: are there potential enablers of infrastructure resilience that can support and enhance community resilience, and are there significant weaknesses in infrastructure resilience that have the potential to limit a community's ability to be resilient? It was also noted that the linkage between infrastructure and community resilience appears very clear, as a community cannot recover without vital services such as, power, water, food, medical care, and money. In turn, infrastructure cannot be fully resilient without close linkages to community and synchronizing this relationship is critical and challenging.

Ms. Grayson underscored the importance of identifying the infrastructure enablers that help strengthen community resilience. She noted that while there will never be a perfect solution, there currently exist a number of enablers that have a proven record of performance, and that they can be effectively deployed in a typical or traditional scenario such as a hurricane, earthquake or incident that has been experienced many times before.

Ms. Grayson then focused on the key aspects of enhancing the synergy between critical infrastructure and community resilience. She first noted this synergy cannot be achieved without considering the combined capabilities of both the infrastructure owners/operators and the community. This relationship between the infrastructure, the community and individuals complements and stabilizes the capabilities of the infrastructure, aiding in the minimization and possibly even elimination of the impact of disruptive events. Ms. Grayson stated that communities are inherently resilience and attempt to return to normalcy immediately but was also quick to advise that a major disruptive event can result in devastating consequences that prevent this from occurring.

The next portion of the report focused on information sources that have been used for the study to date. Ms. Grayson noted that the study has drawn upon the depth and knowledge of members of the NIAC, subject matter experts in the field, and previous community resilience studies that have identified relevant best practices and case studies. Subject matter expert input has been collected through interviews with executives in the critical infrastructure sectors, panel discussions as well as outreach with groups such as the State, Local, Tribal and Territorial Government Council (SLTTGCC) and Regional Consortium Council (RCCC). Ms. Grayson further commented on the information the RCCC provided, stating it was extremely helpful as that group has been looking in various capacities at the issue of community resiliency and the interaction between the community and critical infrastructures.

Ms. Grayson mentioned that the group is considering broadening the outreach of the study to other subject matter experts in both critical infrastructure and community planning emergency response to specifically address what happens when a disruptive event is in progress, what planning is required before that event and what coordination is needed between the local community and the government. The ultimate goal is to allow

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these communities to cycle through recovery mode and move back to normal operations in the least amount of time. The group is also looking at policies and procedures that are in place and additional literature on the subject. According to Mr. Grayson the goal here is to ensure that the study has enough information and a solid, well-rounded foundation to come forward and make substantial and informative recommendations.

The next area of the *Optimization of Resources for Mitigating Infrastructure Disruptions* study discussed included the key questions and the examination of these by the group. The questions that were mentioned by Ms. Grayson included: what are current practices in aligning critical infrastructure resilience with community resilience; are there existing models and public/private partnerships that can guide improvements in critical infrastructure resilience; and what are the best areas of opportunity to achieve synergy among communities and sectors? These questions were designed to help frame the context of the study and the feedback the group has received to date has provided valuable insight into community resilience. Ms. Grayson specifically pointed out that small communities have been discussed and examined, noting the fact that such communities might be dependent on a single set of companies or even just one company, possibly making them less resilient. The group has looked at government policies and learned about specific programs that may aid these areas to address this challenge.

Ms. Grayson then provided an update as to where the study stood regarding engagement outreach. The outreach being conducted involves three main areas of capturing insights and perspectives; community, the owner/operators and comparing community perspectives with that of the owner/operators. She stated that the focus of this study is more on the people and communities than the critical infrastructure itself making the first area, community, the most critical phase of the group's engagement. When discussing the issue of owner/operator engagements, Ms. Grayson stated that this outreach has proven beneficial with subject matter experts providing valuable insights, best practices, and lessons learned. She further noted that many of the issues and topics discussed ran parallel to the community perspective on resilience. Ms. Grayson then introduced Mr. Tom Noonan to complete the presentation.

Mr. Noonan reiterated that the group had completed a large portion of phase one and many of the phase two engagements with subject matter experts. He also noted that the phase two engagements with subject matter experts included not only experts from multiple critical sectors, but also community focused organizations that help bring a balanced perspective to the group including the SLTTGCC. At this point a question was raised regarding the exact title for the SLTTGCC and Mr. Noonan defined the acronym. Ms. Nancy Wong added that the group is part of the sector partnership and consists of state and local government officials that represent homeland security advisors (HSAs) or their equivalent throughout the state and local communities and tribal and territorial governments. Mr. Noonan stated that the study group had received resilience-related information developed during the SLTTGCC plenary session that took place in April with the Honorable Todd Keil. He also noted that in the following week the group would be conducting an interview of the RCCC during their roundtable meeting and looked

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forward to the substantive information that would be gained from that regionally oriented council.

The presentation next focused on a sampling of consensus points that have been discovered to date by the study group. The first consensus point addressed was an emphasis on understanding interdependency within and across communities. It was noted that, while this is not a shocking observation, it appears in most discussions regardless of scale of infrastructure or community. The second consensus point is a clear focus on strengthening the bridge between preparedness and resilience. Mr. Noonan noted this is a reminder that resilience is part of a systematic management plan rather than standalone or reactive. A third point introduced was clear recognition that companies play a major and critical role in communities. The consensus reached is that a company is not just an entity or employer; it also is made up of individuals and families that are community members, volunteers, and neighbors. In this light, collaboration with companies is necessary to keep a community functioning and vital. The fourth and final consensus point mentioned was the need to reflect the diversity of communities including factors such as size of community and pre-disaster economic vitality.

Mr. Noonan shifted focus to the subject of potential recommendations noting the recommendations will address a number of the functional attributes that work and do not work, resource management aspects and application of joint public/private coordination, and where and how changes or fine-tuning to governance can help improve both function and resource management. As more conclusions and recommendations are developed, the group believes that they will not just meet the NIAC's mission of advice to government, but will also identify insights, lessons learned and effective best practices that can immediately be beneficial to infrastructure owner/operators and the communities in which they operate.

Mr. Noonan closed by thanking all of the individuals that had contributed to the effort, citing the well-informed insight and guidance they provided as well as the identification of both key questions and additional subject matter experts to participate in the study. Mr. Noonan specifically thanked the owner/operator community as well as Kerry Pettingill and Cherri Black of the SLTTGCC as their input and assistance with this study has proved invaluable and stated that he looked forward to the upcoming outreach with the RCCC next week. Mr. Noonan then invited questions from the meeting participants.

General Edmonds thanked both groups for their thorough presentations and stated that he wanted to make an observation. He noted an item that should not be overlooked is the subject of cyber security. General Edmonds suggested the idea of placing a disclaimer in all future NIAC studies on this issue, outlining that systems include traditional brick and mortar as well as hardware and cables, but when digital controls, smart grids and access to internet are established, vulnerabilities are introduced. General Edmonds stated this is an important topic that needs to be addressed in order to avoid a position reflecting resilience across the board only to discover the system is not equipped to recover from a cyber attack after it has been hacked.

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In response, Vice-Chairman Berkeley informed the group that the *Framework for Establishing Critical Infrastructure Resilience Goals* study group included a cyber security subject matter expert from NERC that recently moved to the private sector. It is the intent of the group to keep him involved in the study, or if unable to achieve this, locate an additional subject matter expert, as it is imperative that this subject be addressed within the study. Mr. Noonan informed the group of the participation of Peter Allor and Patrick Gray, both cyber security experts, in the *Optimization of Resources for Mitigating Infrastructure Disruptions* study and went on to suggest their assistance in the *Framework for Establishing Critical Infrastructure Resilience Goals* study. It was agreed that cyber security must be incorporated into both studies as a common concern.

Next, Deputy Assistant Secretary Flynn asked both Mr. Wallace and Ms. Grayson about the ability to develop a metric of what constitutes good resiliency practices from each study. Ms. Grayson stated that this is an issue the group considered where communities and individuals are concerned. She went on to note the issue of defining success; is it the loss of no life or the ability to quickly return to normalcy? As development of the report progresses the metric issue is an important topic, as it is imperative to know if everything possible is being done and how to measure success. Mr. Wallace responded by saying that in both the electric and nuclear sector there are existing metrics, to the degree that the sectors are almost awash in these. He went on to state that the stress scenario, though not a metric per se provides an analysis of failure under extreme circumstance with the issue being how are the gaps closed. Mr. Wallace then cited the Comprehensive Reviews conducted within the nuclear sector, which identified as many as 3000 gaps which the sector is now working with DHS to address.

Upon determination there were no further questions for the presenters, Chairman Nye moved to the next item on the agenda, new business for consideration by the Council.

### **VII. NEW BUSINESS**

*NIAC Chairman Erle A. Nye,  
Chairman Emeritus, TXU Corp.*

Under the topic of new business, Chairman Nye directed the Council's attention to two study topics the Council was asked to take under consideration during the April meeting, one regarding the subject of information sharing and the other emergency services. Mr. Nye noted that, considering the lack of subject matter experts among the members of NIAC for this specific area, a study regarding emergency services might not be practical at this point. He then turned the focus of the discussion to the suggested information sharing study. Mr. Nye informed the Council that Mr. Jim Nicholson of PVS Chemical agreed to co-chair the study and the first step would be to conduct a scoping study before the next meeting on October 19, 2010. The expectation is that membership will be closer to its authorized number and there will be resources available to participate in the study. Four individuals have agreed to assist Mr. Nicholson in this endeavor: Vice-Chairman Berkeley, Mr. Bill Fischer, Mr. Tom Noonan and Mr. Bill Muston. Mr. Nye then re-

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introduced Vice-Chairman Berkeley to provide a brief presentation on the proposed study.

Vice-Chairman Berkeley thanked Chairman Nye and began his presentation by providing background information regarding the origin of the tasking which included a brief summary of the 2006 NIAC study entitled, *Public-Private Sector Intelligence Coordination*. This study focused on public/private sector intelligence coordination, and a number of the recommendations that came from the study have been adopted. Looking now four years later, this tasking would provide an opportunity to revisit a number of recommendations and issues discussed as well as address the concern in the private sector that they still do not feel they are getting all of the intelligence information that they need, while specifically examining the complexities within this issue.

Since the last study there have been a number of major events that have transpired which include the establishment of state and local fusion centers, a move forward by DHS in their implementation of the information sharing environment for critical infrastructure, and a shift from the mentality of guns, gates and guards protection to an All Hazards approach. Mr. Berkeley spoke briefly on the concept of fusion centers, a vehicle by which government agencies coordinate and critical infrastructure participants learn key information the intelligence community has obtained.

Vice-Chairman Berkeley spoke to the concept for the study noting it would be basic but informative. The proposed study would review and assess the progress that has been made since the 2006 study as well as identify gaps and recommendations for future improvements. The group would identify processes that can reduce risk to critical infrastructure such as revising the current sharing model if that proved to be necessary. A final goal would be to recommend policies and practices that would enhance public/private information sharing. The study would consider the following issues: are fusion centers a good place to interact with locally-owned critical infrastructure owners, how can the resources in the fusion centers and protective security advisors be leveraged, and how best to inform critical infrastructure owners/operators about fusion centers and their role in information sharing. Fusion centers have been established across the country, allowing the Council to look at a well distributed model. Another issue being considered for the study is the possibility of DHS building on existing field-level relationships including how would it be accomplished and would it provide added value? Two final topics for consideration in the study are the perception that there still is a lack of understanding at all levels of government about critical infrastructure capabilities and the use of the Homeland Security Information Network developed by DHS.

Chairman Nye thanked Vice-Chairman Berkeley for the presentation and reiterated that this effort was worthwhile but would require scoping before final consideration of the Council. Mr. Wallace noted that the Framework study would be near completion by October and the insights from that report may be potentially beneficial to this proposed tasking. Chairman Nye thanked Mr. Wallace for his comments and asked him to discuss this possibility with Mr. Nicholson as part of the scoping effort.

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Chairman Nye moved on to outline the NIAC schedule for 2011. Outreach was conducted to determine the dates of availability for the majority of the Council members and these were the best dates. This outreach resulted in the following dates being established for the 2011 calendar year; January 18, April 19, July 12 and October 11, 2011.

Next a request was made by a NIAC member to obtain the number of NIAC recommendations that had been adopted to date. During past testimony in front of the House Homeland Security Committee it was noted that 60% of NIAC recommendations had been adopted at some level. Since that time there have been a number of recommendations presented and it is important to track the adoption rate. Mr. Nye agreed with this request and thought it would be valuable to get this information to the Council, as the main reason it had been so aggressive and pro-active was because it believed the recommendations had been received well and implemented to the extent possible and appropriate. The NIAC Secretariat staff was tasked with providing a report out at the January 18, 2011 meeting.

Chairman Nye again thanked Assistant Secretary Keil for his attendance and specifically raised the issue of NIAC membership to both him and Deputy Assistant Secretary Flynn. It was important for them to be aware that Council membership is well below the authorized number. With a lower number, the Council was lacking key subject matter experts in areas such as emergency services, telecom, water, and information technology. This is critical because it is imperative to have subject matter experts work on the studies as well as a broad representation from all of the sectors in each. After his comments on the Council membership issue, Chairman Nye turned to Assistant Secretary Keil for comments.

Mr. Keil thanked Chairman Nye and stated he was glad to be able to attend the NIAC QMB. He apologized for not being there for the start of the meeting and thanked Deputy Assistant Secretary Armstrong for attending the meeting and providing remarks, as well as Deputy Assistant Secretary Flynn for his attendance. He also recognized Tracy Hannah who was in attendance at the meeting representing the DHS private sector office. He reiterated that the NIAC is widely recognized by the White House and throughout the government for the work it conducts and its efforts were greatly appreciated especially considering the current constraints of resources. Mr. Keil reported that potential new member nomination packages had been delivered to the White House for consideration. He assured the Council that both DHS and the White House recognize the criticality of the membership issue and went on to pledge his support in achieving the authorized number of NIAC members as soon as possible.

Mr. Keil noted as he travels around the country he is informed by state homeland security advisors that the work of the NIAC is seen favorably and often incorporated into the work they are doing at the local level. In closing he again thanked the Council for their

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outstanding work and pledged his support regarding membership nomination and appointment for the NIAC.

**VIII. ADJOURNMENT**

*NIAC Chairman Erle A. Nye,  
Chairman Emeritus, TXU Corp.*

Chairman Nye thanked Secretary Keil and requested an opportunity in the future to reach out to him to discuss the NIAC. The chairman asked if Mr. Flynn had any comments and he briefly stated his thanks to the Council and appreciation of the work that had been presented by the two studies. Mr. Nye recognized Ms. Tracy Hannah, Deputy Director, Private Sector Office within the Office of Policy and thanked Deputy Assistant Secretary Sue Armstrong for her attendance. Upon his concluding remarks and with no other comments from NIAC members, Chairman Nye again thanked all in attendance and adjourned the meeting.

I hereby certify the foregoing minutes accurately represent the discussion and events that transpired at the meeting held on the date first noted above.

By: \_\_\_\_\_  
Erle A. Nye, Chairman, NIAC

Date: \_\_\_\_\_

# National Infrastructure Advisory Council (NIAC)



## **A Framework for Establishing Critical Infrastructure Resilience Goals Working Group**

**July 13, 2010**

Al Berkeley  
Chairman  
Pipeline Trading Systems

Mike Wallace  
Vice Chairman  
Constellation Energy  
Chairman, UniStar Nuclear Energy

# Overview

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- ❑ Objectives
- ❑ Study Approach
- ❑ NIAC and Study Group Members
- ❑ Progress
- ❑ Resilience in the Electric Sector
- ❑ Results of the Stress Test Exercise
- ❑ Issues Affecting Electric Sector Resilience
- ❑ Next Steps

# Objectives

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- ❑ Assess how CIKR sectors currently use resilience practices and strategies to mitigate operational risk
- ❑ Develop a process to assist sectors in discerning resilience goals
- ❑ Recommend policies and practices that will enhance resilience in CIKR sectors

# Study Approach

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- Three sequential case studies:
  - Nuclear and Electricity
  - Oil and Natural Gas
  - Transportation
- Each case study will:
  1. Assess current resilience practices and strategies
  2. Assess sector resilience in “stressed” state
  3. Develop a process for developing sector goals
  4. Identify policies and practices to enhance sector resilience
- The results of each case study will inform and refine subsequent case studies

# NIAC Member Participation

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- Mr. Berkeley: Overall Study Chair
- Mr. Wallace: Lead—Electric/Nuclear Case Study
- Ms. Wyrsh: Lead—Oil and Natural Gas Case Study
- Mr. Wells: Lead—Transportation Case Study

# Study Group Members

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- ❑ **Mike Wallace**, Vice Chairman, Constellation Energy, **Study Group Chair, NIAC Member**
- ❑ **Al Berkeley**, Chairman, Pipeline Trading Systems, **Study Group Chair, NIAC Member**
- ❑ **Michael Assante**, former Vice President and Chief Security Officer, North American Electric Reliability Corporation (NERC)
- ❑ **William Ball**, Executive Vice President and Chief Transmission Officer, Southern Company
- ❑ **Terry Boston**, President and CEO, PJM Interconnection
- ❑ **A. Christopher Burton**, Senior Vice President, Baltimore Gas and Electric Company
- ❑ **Gerry Cauley**, President and CEO, North American Electric Reliability Corporation (NERC)
- ❑ **Jeff Dagle**, Chief Electrical Engineer, Pacific Northwest National Laboratory
- ❑ **Ken Daly**, President and CEO, National Association of Corporate Directors
- ❑ **Kenneth DeFontes**, President and CEO, Baltimore Gas and Electric Company
- ❑ **Jose Delgado**, President and CEO, American Transmission Company
- ❑ **Mark Engels**, IT Risk Management, Dominion Resource Services
- ❑ **Ed Goetz**, Executive Director, Corporate and Information Security, Constellation Energy
- ❑ **Scot Hathaway**, Vice President, Transmission, Dominion Virginia Power
- ❑ **Paul Koonce**, CEO, Dominion Virginia Power
- ❑ **Ron Luman**, National Security Analysis Department Head, Johns Hopkins University/Applied Physics Laboratory
- ❑ **Robin Manning**, Executive Vice President, Power System Operations, Tennessee Valley Authority (TVA)
- ❑ **Dan Sadler**, Program Manager - Business Continuity, Constellation Energy
- ❑ **Debra van Opstal**, Senior Fellow, Resilience Policy, Center for National Policy

# Progress

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## □ Accomplishments

- 16 interviews of CEOs, executives, and policy leaders completed
- >50 studies and documents reviewed
- 11 Study Group discussions conducted
- All-day Stress Test Exercise at BGE conducted

## □ Planned

- CEO Roundtable planned for July 14
- 1-3 additional interviews
- 6-8 Study Group discussions

# Resilience Framework

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## Robustness

- The ability to absorb shocks and keep operating

## Resourcefulness

- Managing a disaster as it unfolds

## Rapid Recovery

- Getting back to normal as quickly as possible

## Adaptability

- Absorbing new lessons from a catastrophe

\*Based on Stephen Flynn and NIAC definitions

# Resilience in the Electric Sector

*Examples of resilience based on interviews*

		Robustness	Resourcefulness	Rapid Recovery	Adaptability
<b>People &amp; Processes</b>		<ul style="list-style-type: none"> <li>• Announced and unannounced emergency drills for control centers</li> <li>• Extensive continuity of operations plans</li> </ul>	<ul style="list-style-type: none"> <li>• Highly trained and drilled transmission operators</li> <li>• RTOs prevent cascading failures</li> </ul>	<ul style="list-style-type: none"> <li>• Mutual aid agreements</li> <li>• Priority recovery of electric services for customers (e.g., hospitals, fire, police)</li> </ul>	<ul style="list-style-type: none"> <li>• Revising emergency response plan after lessons learned during hurricanes, ice storms, floods, etc.</li> </ul>
		<ul style="list-style-type: none"> <li>• Interconnected grid provides enormous absorptive capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Real-time monitoring of transmission using “state estimators”</li> <li>• Automated system transfer for N-1 failure</li> </ul>	<ul style="list-style-type: none"> <li>• Shared inventory of spare EHV transformers</li> <li>• Spare transmission towers for rapid reconstruction (24 hr)</li> </ul>	<ul style="list-style-type: none"> <li>• Substations placed on stilts after major floods</li> <li>• New interconnects</li> <li>• Derated underground power line based on reported failure in another country</li> </ul>

# Results of Stress Test Exercise

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- ❑ **Disaster Scenario:** Coordinated attack results in simultaneous loss of two key substations and 500kV transmission lines
- ❑ **Impact:** At least 6 months of daily power outages, some customers out for extended periods; outages affect essential services such as water supply and fuel, huge local economic impact; consumer and political pressure, possible social chaos
- ❑ **Gaps and Seams:** Vulnerability of substations, availability and design specifications of high voltage transformers, lack of experience in managing unusual disaster scenarios, access to facilities if a crime scene, time for approvals to rebuild facilities
- ❑ **Long-Term Issues:** Cost recovery to address high-impact, low frequency events; coordination of government agencies; ROW issues for system resilience; supply chain for EHV transformers; public & private roles in securing the grid for national security needs

# Issues Affecting Electric Sector Resilience

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- ❑ Infrastructure Design and Assets
  - Large investment in long-lived capital assets
  - Securing rights-of-way for interconnection and expansion
  - Increased use of digital controls; Smart Grid technologies
- ❑ Supply Chain
  - Long lead time, customized designs for EHV transformers
  - Reliance on foreign vendors
- ❑ Sector Interdependencies
  - Oil & NG, telecom, transportation
  - Co-location of utilities in rights-of-way
- ❑ Workforce
  - Aging workforce with technical operating experience

# Issues Affecting Electric Sector Resilience

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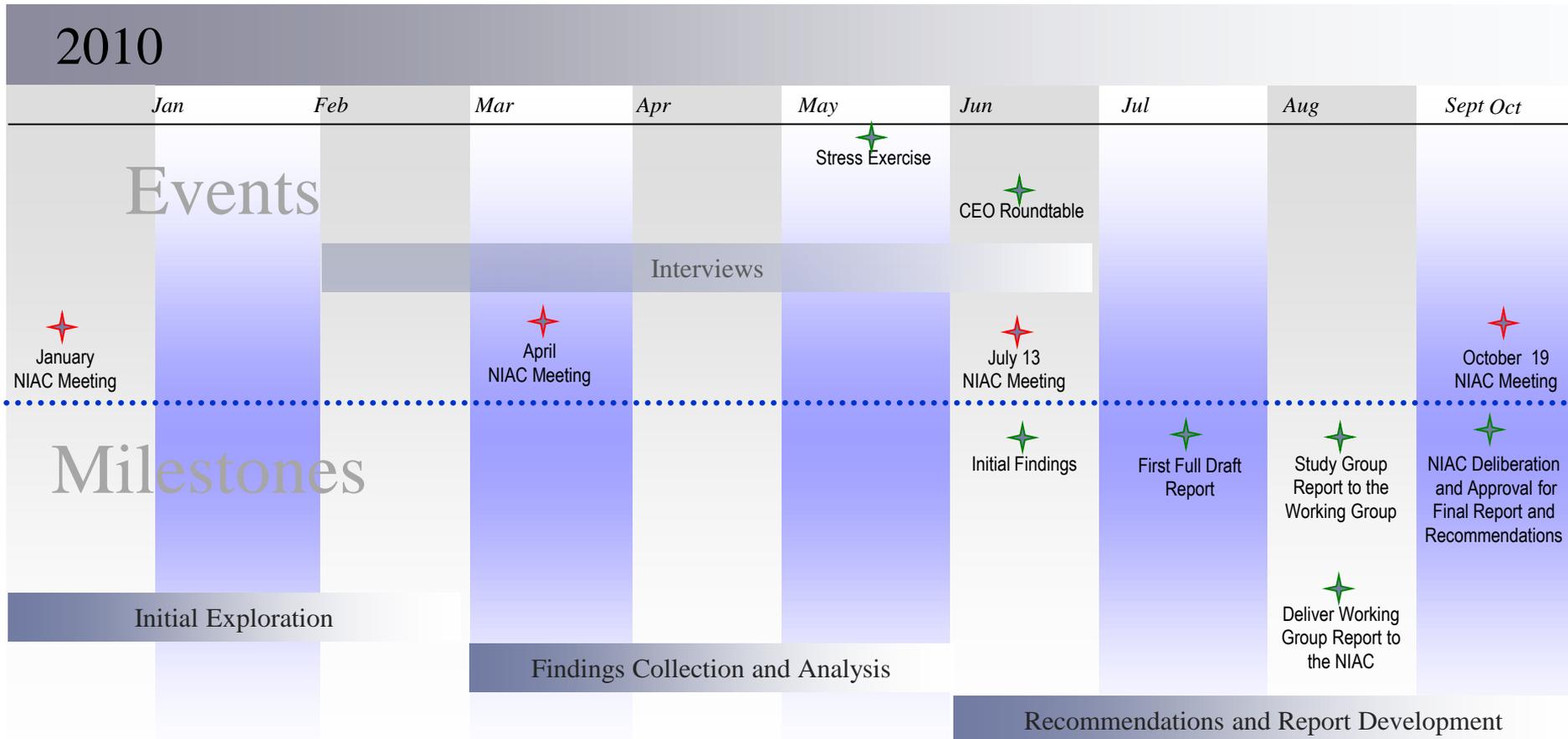
- ❑ Changing Risk Landscape
  - Coordinated physical & cyber attack, electromagnetic pulse/geomagnetic storm, pandemic, catastrophic weather events
- ❑ Markets and Regulatory Structure
  - Highly regulated sector; cost recovery through FERC and PUCs
  - Business case for increased investments in resilience
- ❑ Public/Private Roles and Responsibilities
  - Sharing risks for high-impact, low-frequency risk
  - Responsibilities & expectations of govt and public in disasters
  - Coordination of governments and sector during a crisis
- ❑ Standards
  - Opportunity for improvement but also unintended consequences
- ❑ Information Sharing
  - Ability to share classified threat information

# Next Steps

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- ❑ CEO Roundtable July 14 will help clarify public and private sector roles and actions to address gaps in resilience
- ❑ Complete interviews, research, and Study Group discussions
- ❑ Develop findings and recommendations
- ❑ Begin next case study – oil and natural gas or transportation?

# Study Timeline



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# Questions?

# National Infrastructure Advisory Council (NIAC)

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## Optimization of Resources for Mitigating Infrastructure Disruptions Working Group

**July 13, 2010**

Tom Noonan  
Former CEO  
Internet Security Solutions

Margaret Grayson  
Principal  
Essential2Management

# Overview

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- ▣ Context: The DHS Mission
- ▣ Framing the Study
- ▣ Key Aspect: Enhancing the Synergy Between CIKR and Community Resilience
- ▣ Study Approach and Status
- ▣ Samples of Emerging Consensus Points
- ▣ Areas for Potential Recommendations
- ▣ Study Leadership

# Context: The DHS Mission

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- The Administration has established a new strategic framework for the Department of Homeland Security
- A core mission of resilience: “Foster individual, community, and system robustness, adaptability, and capacity for rapid recovery”
  - Mitigate risks to communities
  - Enhance recovery capabilities
  - Ensure continuity of essential services and functions
- An objective of ensuring *infrastructure* resilience:
  - “Enhance the ability of critical infrastructure systems, networks, and functions to withstand and rapidly recover from damage and disruption and adapt to changing conditions”
- An objective of ensuring *broad-based* resilience:
  - “Improve capabilities of families, communities, private-sector organizations, and all levels of government to sustain essential services and functions”

# Framing the Study

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- The leading questions:
  - What are the potential enablers of infrastructure resilience that can support and strengthen community resilience?
  - Are there significant weaknesses in infrastructure resilience that limit the ability of communities to achieve resilience?
- Many critical sectors have established, well-proven programs and processes for resource sharing; e.g.
  - Mutual-aid agreements
  - Pre-positioning and spares availability
- CIKR may provide key resource capabilities; e.g.
  - Lessons learned and model approaches
  - Leadership in planning and response for service restoration
  - Understanding of interdependencies, vulnerabilities, and options for resilient capabilities

# Key Aspect: Enhancing the Synergy Between CIKR and Community Resilience

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- **Infrastructure resilience** is the ability to reduce the magnitude and/or duration of disruptive events. It is the ability to *anticipate, absorb, adapt to, and/or rapidly recover* from a potentially disruptive event. Key aspects:
  - Interdependency effects
  - Resource availability/flexibility/sharing
  - Time to service recovery
  
- **Community resilience** is the capability to return citizens to work, reopen businesses, and restore the basic services and economic stability of a community or a linked group of affected communities. Key aspects:
  - Understanding of shared dependencies – across communities, across services
  - Timing and coordination of resources – local, regional, and national

# Information Sources

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- Executive Interviews in Key CIKR Sectors
  - *Strategic perspectives on interdependencies among sectors and communities*
- Panel Discussions with SLTTGCC and RCCC Members
  - *The intersection of sector and community resilience*
- Interviews with Subject Matter Experts
  - *Interdependencies and community effects*
- Survey of Government Policies and Programs
  - *Current practice: Federal, State, community*
- Review of Community Resilience Studies and Literature
  - *Case studies and best practices*

# Sample of Key Questions

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## □ Functions

- What are current practices in aligning CIKR resilience with community resilience?
- Are there existing success models in public-private partnerships that can guide improvements in CIKR/community resilience?
- Where are the best areas of opportunity to achieve synergies among communities and sectors?

## □ Resources

- Are their key weaknesses in resource management and sharing?
- What are opportunities to enhance collaborative resource planning and management?

## □ Government Policy and Programs

- How do existing government programs help or hinder synergies in these areas?
- What steps might the government take to encourage the contribution of CIKR resilience to community resilience?

# Phasing of Outreach and Engagement

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## Three Main Phases:

- Capturing Community Perspectives and Insights
  - Provides a “non-NIAC” information baseline that crosscuts infrastructure sectors and service-delivery areas
  - SLTTGCC Roundtable
  - RCCC Roundtable
  - Discussions with other regionally-focused organizations and experts
- Owner/Operator Engagements
  - Interviews and discussions with SMEs from key sectors
  - Covers physical and cyber aspects of resilience
  - Shares results of first phase with infrastructure owners and operators
  - Builds joint picture of CIKR/community resilience
- Comparing Community and Owner/Operator Perspectives
  - Follow-up engagements to clarify and expand on identified issues
  - Improve joint understanding of problems *and* potential solutions

# Status of Engagement

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## □ SLTTGCC Perspectives:

- Roundtable: Two sessions conducted in June
- Plenary session conducted with Office of the ASIP in April

## □ RCCC Perspectives:

- Roundtable: Scheduled for July 20
- Plenary session conducted with Office of the ASIP in early June

## □ Subject Matter Expert Interviews Underway:

- Multiple critical sectors, including electricity, emergency services, telecommunications, and healthcare
- Regionally-focused organizations/individuals

# Samples of Emerging Consensus Points

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- ❑ Enhance understanding of interdependencies *within and across* communities
- ❑ Institutionalize relationships and best practices for communication and coordination *before* things go wrong
- ❑ Companies play a critical role in communities; coordination of public and private resources is critical
- ❑ Tailor Federal government coordination processes to reflect that “one size does not fit all”

# Areas for Potential Recommendations

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- Functions: Interdependency and Timing
  - Improving tools for planning and assessment exercises such as table tops
  - Enhancing modeling capabilities for preparedness and response at state and community levels
- Resources: Planning and Coordination
  - Assuring availability of time-critical resources
  - Capitalizing on potential synergies in mutual assistance and resource sharing
- Governance: Policy and Programs
  - Enhancing the availability of current Federal programs (e.g., Protective Security Advisors, the Regional Resilience Accessibility Program)
  - Attaining alignment and synergy between bottom-up (community) and top-down (national) planning and strategy

# Study Leadership

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- Working Group and Sponsors
  - **Peg Grayson**, Principal, Essential2Management
  - **Tom Noonan**, Former CEO, Internet Security Solutions
- Study Group (current membership)
  - **Peter Allor**, Senior Security Strategist, IBM Corporation
  - **Cherrie Black**, SLTTGCC Co-Chair and Chair, Regional Partnership Working Group
  - **Lt. Gen (ret.) Albert J. Edmonds**, Chairman, Edmonds Enterprise Services, Inc.
  - **Patrick Gray**, Principal Security Strategist, CISCO Systems
  - **David Kepler**, Executive Vice President, Chief Sustainability Officer, Chief Information Officer, Corporate Director of Shared Services, Dow Chemical
  - **James B. Nicholson**, President and Chief Executive Officer, PVS Chemicals, Inc.
  - **Ulie Seal**, SLTTGCC Chair